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ABSTRACT

External resource acquisition was investigated as one factor associated with the development of the University of New Mexico from an undergraduate teaching institution toward becoming a nationally-ranked graduate research university. A longitudinal, ethnohistorical study was undertaken for the 1967-1978 period. The qualitative research methodology involved an extensive review of institutional documents and informal interviews with key university administrators. Attention was directed to the strategic decision by key university administrators to establish the Office of the Vice President for Research as a means of promoting campus research and securing external research support. The findings indicate that the greater the dependency of an institution on its external environment for the support of faculty research, the more active key administrators will be in securing resources. In addition, the greater the threat to the university's ability to secure research support, the more likely the institution will be to participate in interinstitutional coalitions. Administrative corrective action, triggered by an exogenous shock, took the form of a political-economic coalition focused on enhancing the institution's resource position. Theoretical propositions suggested by the findings are identified. (Author/SW)

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ACQUISITION: IMPLICATIONS FOR A DEVELOPING
RESEARCH UNIVERSITY

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Invited Symposium
Environmental Change: Implications
for Emerging Research Universities

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ABSTRACT

ENVIRONMENTAL UNCERTAINTY AND EXTERNAL RESOURCE ACQUISITION: IMPLICATIONS FOR A DEVELOPING RESEARCH UNIVERSITY

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External resource acquisition was identified as one factor associated with the development of the University of New Mexico from an undergraduate teaching institution toward a nationally-ranked graduate research university in this longitudinal, 1967-1978, ethnohistorical study. The qualitative research methodology employed in this institutional study included an extensive analysis of documents and informal interviews with University administrators. This study examines the strategic decision by key University administrators to establish the Office of the Vice President for Research as a means of promoting campus research and securing external research support. The findings indicate that the greater the dependency of an institution on its external environment for the support of faculty research, the more active key administrators will be in securing resources; and, the greater the threat to the University's ability to secure research support, the more likely the institution will participate in inter-institutional coalitions. Administrative corrective action, triggered by an exogenous shock, took the form of a political-economic coalition focused on enhancing the institution's resource position. External resource acquisition was associated with the University's emergence as a nationally-ranked research institution.

Preface

The invited symposium: Environmental Change: Implications for Emerging Research Universities is composed of four papers entitled: (1) "The Implications of Structural Reorganization in an Emerging Research Institution," (2) "Cognitive Imaging and Organizational Change: The Social Dynamics of an Emerging Research University," (3) "Inter-organizational Cooperation in a Competitive Research Environment," and (4) "Environmental Uncertainty and External Resource Acquisition: Implications for a Developing Research University." These papers are based on the findings of one research effort directed toward investigating how an institution of higher education responded to changes in its research environment and developed from a teaching institution toward a nationally ranked graduate research university. These papers were prepared specifically to analyze distinct factors associated with institutional research development and, as such, to stand as critical and independent works. In consideration that these papers were based on the same research, sections of these papers and some of the data included in the descriptive narratives that impinged on the manner in which the institution responded to events, are the same. The symposium format provides an appropriate forum not only to discuss these factors but to synthesize the propositions in an effort to present a limited but grounded theory of developing research universities.

Introduction

The principal objective of this study has been to discover, examine, and explain external resource acquisition as one factor associated with the development of the University of New Mexico from an undergraduate teaching institution in the direction of a nationally-ranked graduate research university. The University of New Mexico was selected as the unit of study because it was representative of a group of Rocky Mountain and High Plains universities that appeared to be engaged in similar developmental activities during a period of uncertainty about the federal government's commitment to university research support and provided a unique opportunity to study institutional development.

The data bearing on institutional development are briefly reported for two separate, sequential time periods. The initial sections of the descriptive narrative cover the internal modification of the organizational structure of this university, including the establishment of the Office of the Vice President for Research. Such adjustments also facilitated the University's attempts to secure external research support. The latter sections of the descriptive narrative covered the activities of the Office of the Vice President for Research focusing in particular on efforts to protect its research interests and to secure external research support funds. Both sets of organizational development activities were associated with the University's emergence as a nationally-ranked research institution.

Methodology

The dynamic process through which an institution of higher education responds to change in its external environment and develops from an undergraduate teaching institution to a graduate research university is not well understood. The literature on institutional adaptation to external environmental change is essentially atheoretical in nature and contains little work designed to test theories describing the dynamics of the change process (Giaquinta, 1973, p. 178).

This study is directed toward developing a set of naturalistic generalizations and building theory rather than toward affirming a prevailing theory. The significance of discovering theory from data, the generation of "grounded theory" (Glaser and Strauss, 1967), lies in the researcher's ability to arrive at relevant "predictions, explanations, interpretations and applications" (p. 1) that are both empirically sound and singularly pertinent to the phenomenon under study.

This study focuses on a highly particular slice of the University's environment rather than comprehensively describing and analyzing an institution's responses to changes in its macro environment. It is limited to the University's research environment and presents only a piece of that larger story.

Rationale

The choice of research methodology was determined by the nature of the problem under investigation (Lofland, 1971; Schumacher, 1972). This study employed a methodology that recognized that the relation-

ships and events experienced by participants occurring over time should be examined comprehensively and in their natural setting. Filsted (1979) has noted that an important characteristic of qualitative methodology allows the researcher to get close to the data, obtain first-hand knowledge and develop the "analytical, conceptual, and categorical components of explanation from the data itself" (p. 33). Reality, meaning, and behavior were analyzed from the perspective of the subjects' interpretation of the world. Attention to the subjects' perspective allowed the researcher to obtain a rich contextual understanding of events and to obtain a powerful way to understand the phenomenon of cognitive imaging in organizational change. A field study approach provided a flexible means through which a university's external resource acquisition efforts could be examined comprehensively (Babbie, 1979) and in context.

Data Collection

In utilizing qualitative research methodology for the study of organizations, it is important to employ a wide variety of data collection techniques to ensure the flexibility necessary to gathering relevant data (Glaser and Strauss, 1967) and to assuring the validity and reliability of the data. The nature of the phenomenon under study lent itself to using the ethnohistorical approach described by Schumacher (1972) and Smith (1978). This approach focuses on "the accumulation of evidence about events in the past and their subsequent interpretation by the participants as part of a larger phenomenon (Higbie, 1981, p. 47). The ethnohistorian attempts to go beyond the official description of events and to include personal recollections,

provocatively-rich account of events. To accomplish this goal, a combination of qualitative research techniques commonly associated with the participant-observation approach (McCall and Simmons, 1969) was employed. By analyzing documents such as memoranda, desk logs, letters, written reports, minutes of board meetings, proposals, journal articles, newspaper accounts and press releases, explicit knowledge was obtained and organized into a longitudinal historical record that chronicled events during the "bounded" (Stake, 1978, p. 7) period of time, 1967-1978, during which the University of New Mexico moved in the direction of a graduate research university. These documents collected from the "official files" of the University of New Mexico and from the personal files of participants proved to be a valuable source of information that provided the researcher with an additional avenue by which to observe how individuals reacted to external events and initiated actions inside the organization. Through informal interviews, the researcher obtained additional, explicit information and "tacit knowledge" (Polyani, 1958) about those pre-verbal understandings of events pertinent to the research effort.

Through this approach, which is described by Smith and Pohland (1972) as a "multi-method, multi-person, multi-situation, multi-variable matrix (p. 11), opportunities became available to follow Iannaccone's (1975) "reiterative cycle" of definition, data collection, analysis and examination of concepts, and subsequent redefinition, as need emerged from the data, generated by this "disciplined inquiry" (Cronbach and Suppes, 1959).

In most qualitative studies, it is common practice to mask the

identity of persons and places when developing the descriptive narrative. Rist (1982) notes that masking "becomes difficult as too much data is supplied" (p. 10) about people, events and places. Moreover, a substantial amount of information concerning the background and setting of the study is customarily provided in a credible ethnographic study which would enable a determined individual to identify the research location. The University of New Mexico's involvement in the establishment of a Consortium of Rocky Mountain and High Plains universities, the Western Regional Scientific Laboratory, Inc., and its attempt to manage the Los Alamos Scientific Laboratory, all of which are described and analyzed in this study, are unique. For all these reasons it was decided, therefore, to retain the identities of persons, places and events with the provisions that the researcher provide the individuals that participated the opportunity to review and comment on the draft of the descriptive narrative in which their names appeared and in which they were quoted. This process of review and comment by the participants also contributed to the study's validity.

Data Analysis

An effort was made to correlate and analyze the data during the collection phase of this study. Categories developed as a result of preliminary studies were coded and examined for a "goodness of fit" (McCall and Simmons, 1969, p. 233), with new data emerging from interviews and documents during the last seven months of the study. These categories were refined through constant comparison (Glaser and Strauss, 1967) between the original definitions and the emerging data.

The process of data collection and analysis was refined, focused

and directed through the process of "theoretical sampling" suggested by Glaser and Strauss (1967, p. 45). Preliminary categories were examined and redefined, and new categories and sub-categories were generated and tested throughout the study, and data that supported the emerging concepts were designated. By examining and comparing the contexts and concepts, probable relationships were formulated and examined. Through this process several concepts emerged that were felt to be most applicable in illuminating the phenomena under study and were substantially accounted for in the data. The emergent concepts were then elaborated and ordered in propositional form.

Generation of Theory

The development of "grounded theory," which attempts to explain how universities develop in the direction of research institutions, was the final outcome of the study. However, the immediate applicability of the theory should be reserved. Grounded theories emerge from limited ranges of data and are limited to contextual ranges of applications. The development of "special theories adequate to limited ranges of social data (rather than)...the search for all-inclusive conceptual themes" (Merton, 1957, pp. 9-10) is of paramount importance in this study.

The value of research directed towards developing grounded theory lies not in the validation of existing theory but, rather, in the discovery of new understandings and perceptions. This study does not assert that the grounded theory developed here will reflect the manner in which all institutions adjust to changes in their environment or the manner in which they will develop in the direction of graduate research institutions. Rather, it is based on the premise

that "understanding the response of one institution in one setting may contribute to the fundamental and general understanding of how institutions of higher education respond to their environment and pursue development into research organizations" (Bjork, 1983, pp. 179-180). Although the setting changes from one institution to another, it is suggested that the grounded theoretical framework developed here probably reflects elements that can contribute to a better understanding of how any university interacts with its environment and develops in the direction of a research institution.

Background

The association between science and the federal government is a unique American phenomenon (Veysey, 1963) that has proved to be mutually advantageous: government agencies accomplish their applied research with the assistance of trained university scientists, and the government's support of science provides a source of strength to the emergence of scientific research in institutions of higher education.

Although reliance on colleges and universities for the performance of applied research began on a modest basis during the latter part of the 19th Century, the pursuit and support of science by the federal government inside universities grew rapidly (Cowley, 1980; Dupree, 1957; Millet, 1952). During the 1930's scholarly and scientific pursuits were recognized as valuable resources in finding solutions to difficult and pressing national economic and social problems. The practice of linking applied science with practical public service developed as a dominant theme in the federal government's rationale for employing and financially support-

ing university-based research.

The relationship between the federal government and the university research community entered a new era during the 1940's, when both the diversity and scale of research expanded substantially. The federal government accepted the major financial responsibility for the support of scientific research and for establishing a state of mutual dependence (Ashworth, 1972; Kidd, 1959; Price, 1965) with institutions of higher education. The rapid expansion of federal financial support for university-based research, according to Corson (1975) originated in the years just prior to World War II, when the government sought the assistance of highly-skilled faculty researchers.

During and after World War II, federally-sponsored research rapidly became a major campus activity. Federal grants and contracts became the principle means of providing support for scientific research. Federal support for research rapidly overshadowed university resources as the primary means of funding scholarly research activities (Corson, 1975; Kidd, 1959; Strickland, 1967). An indirect result of this shift in research support from the universities themselves to the federal government shaped the fundamental characteristic of government-university relationships during the post-War period (Dupree, 1957; Murphy, 1971; Orlans, 1968) and enhanced the research capabilities of institutions of higher education. The federal government emerged as the principal sponsor of scientific research, and the universities were recognized as the locus for carrying out government research.

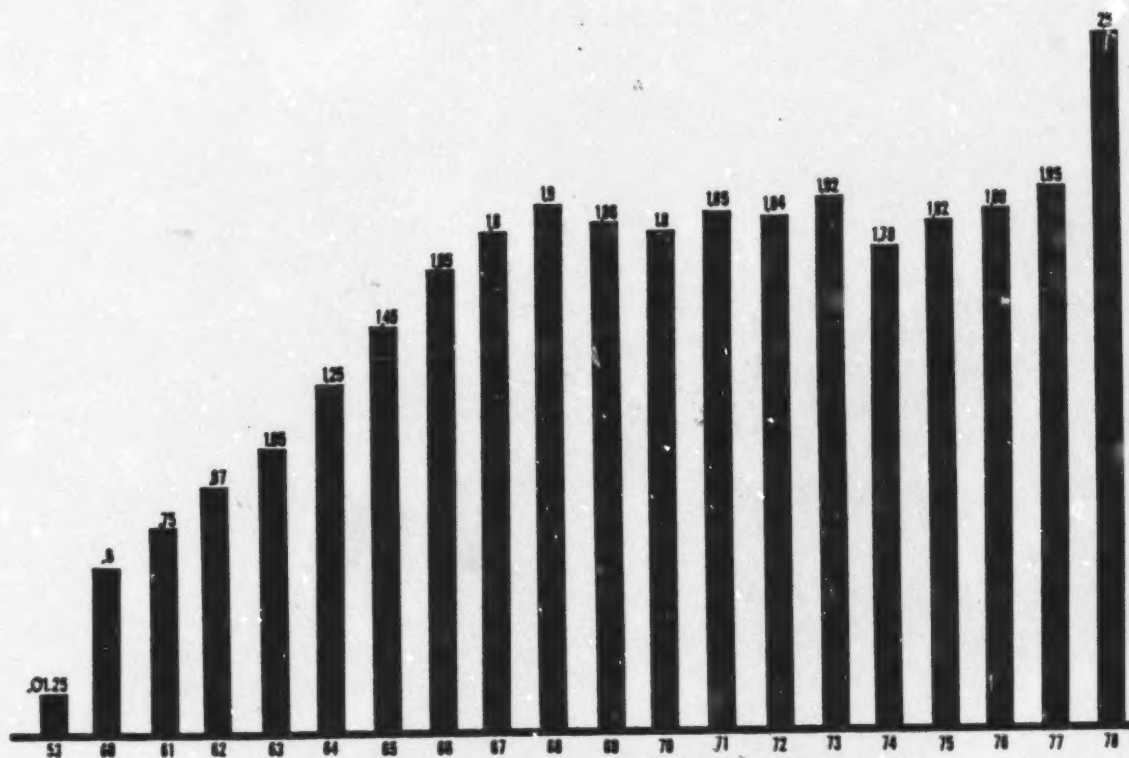
The dramatic increase in federal support for university-based research and development between 1953 and 1968, increasing from

\$1.25 million to \$1.9 billion (Smith and Karlesky, 1977, p. 18)

(Figure 1), had a profound impact on the evolution of established and

Figure 1

Total Expenditures of Federal Research and Development Support by
Universities, 1953-1976 (Constant 1972 Dollars/Billions)¹



¹Data for this figure are based on Smith and Karlesky (1977, p. 18) and the National Science Foundation (1978, p. 2).

developing institutions. The literature suggests that federal support stimulated the growth of campus research, shifted institutional emphasis toward graduate education and research training, shaped the direction of research, dominated its continuance, contributed to the emergence of research as a measure of institutional stature and ushered in a new era of political relations between the universities and the federal government (Babbidge, 1968; Ben-David, 1972; Heimovicks, 1971; Kidd, 1959; Klopsteg, 1959; Price, 1965). As a consequence of this unprecedented and massive support, the shape of research in universities and the direction of research institutions were no longer the concern of the academic community alone but emerged as both a matter of public and institutional attention. The literature suggests that as the external research environment became more dynamic, research universities adapted, some rapidly than others, to the new demands by placing an increased emphasis on research.

Findings

In the years just prior to 1968, when federal support for research and development in the nation peaked, some faculty members and administrators at the University of New Mexico noted the growing national emphasis being placed on research. During the 1967-1968 period the University was characterized as a "young, maturing institution" (personal interview, Travelstead, July 26, 1982) that was in the nascent stages of development as a research institution. The new administration's emphasis on expanding sponsored faculty re-

search was supported by key faculty members and was viewed as an important vehicle through which the quality of instruction, graduate programs and faculty could be improved and as an important vehicle through which the stature of the institution could be enhanced.

During the 1967-1968 period, the University, in moving toward the establishment of the Office of the Vice President for Research, shifted the manner in which it viewed itself internally and the way in which it wanted to be viewed externally. It was a significant shift and a symbolic step in the direction of the maturation of the institution.

The decision to move the institution into the mainstream of academic life by expanding campus research led, in 1967, to the decision to establish the Office of the Vice President for Research. This decision was made by President-elect Heady in consultation with other key administrators and faculty members and was implemented shortly after he became president in 1968.

A number of important factors contributed to successfully modifying the institution's structure to facilitate increasing campus research: (1) reducing the work load on the Academic Vice President; (2) having a person at the Vice Presidential level to concentrate on promoting research; (3) developing support mechanism to facilitate the acquisition of research support; (4) establishing an administrative proposal review mechanism to insure that the institution could meet commitments made; and (5) utilizing research activities as an index for evaluating the institution's research development efforts. These reorganization efforts were specifically

focused on research. Dr. Travelstead noted that, "the position of the Vice President for Research was justified only if it facilitates, expedites and helps to improve policies, procedures and other aspects of research." (Travelstead to Adams, June 17, 1968). The data indicate that between 1968 and 1972, under the direction of the first Vice President for Research, the Dean of the Graduate School, Dr. George Springer, the role of the Office was defined, accepted by the University community and institutionalized.

The administration recognized that it would have to provide more than a symbolic gesture to move the institution in the direction of a graduate research university. The administration became an effective advocate for research on and off campus. It convinced the New Mexico State Legislature to approve measures that would retain 80% of the overhead charged to grants and contracts to be redistributed for the support of research activities and to reduce teaching loads for faculty researchers. The institution moved to formally link research and publication to faculty promotion and tenure. The image of the institution as a research university was enhanced by the increased visibility provided by the Vice President for Research formally representing the University at important local, state and national meetings and policy briefings.

In the Summer of 1972, Dr. George Springer, the first Vice President for Research and Dean of the Graduate School, died. Finding a replacement for Dr. Springer presented the institution with both a challenge and an opportunity. At this juncture in the development of expanded research activities, there was a consensus among faculty and the administration that the research climate on campus could be

improved if an experienced researcher knowledgeable about the institution, the "outside," and capable of playing a major leadership role were appointed.

Dr. Paul Silverman was appointed Vice President for Research in 1973 and initiated vigorous efforts to restructure and focus the activities of the Office on securing research support and enhancing faculty research services. Dr. Silverman observed that Dr. Heady "gave me more opportunity to devote more time to encouraging research and development...establishing relationships both within the campus... and going out and selling the potential of the institution not only at the federal scene" (personal interview, Silverman, March 24, 1982) but at the state level as well. The reorganization of the University's structure was successful. It enabled the institution, through the Office of the Vice President for Research, to concentrate on promoting and supporting campus research. The efforts provided a viable "mechanism" to support faculty research and set the stage for more aggressive, entrepreneurial research development activities.

The federal government was accurately viewed by the University as the major source of research support and was the principal focus of the institution's initiatives in aggressively pursuing research dollars. Dr. Silverman, as part of the new research-development program, began to increase the visibility of the University's research potential by increasing contacts with administrators in federal agencies and among members of the State's congressional delegation.

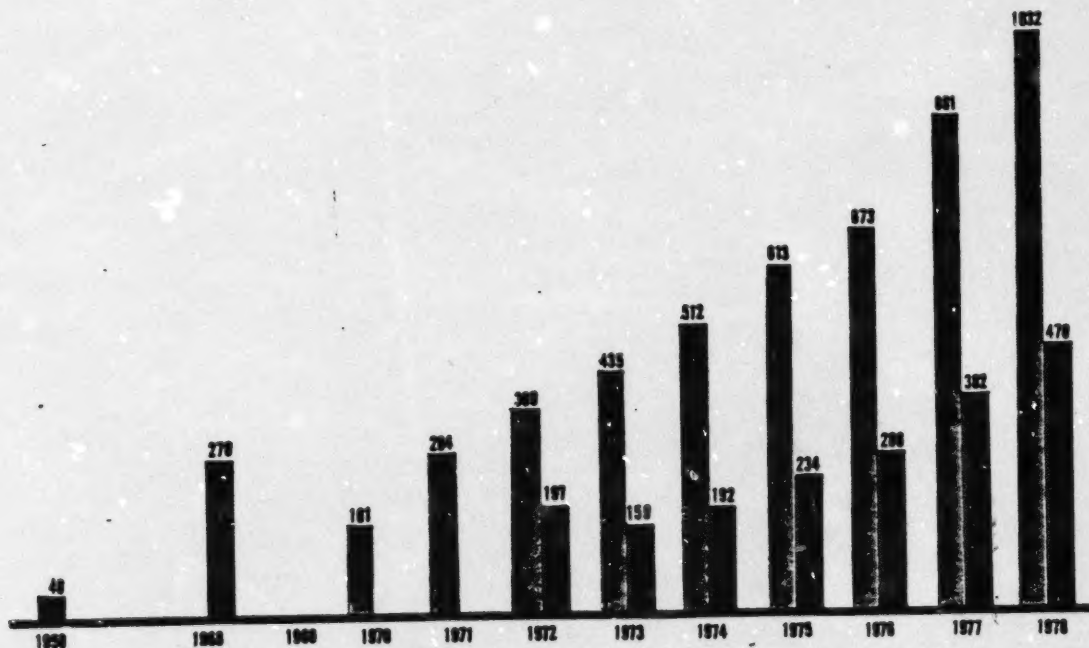
To a lesser extent, because of the limited availability of research funds, Kasner also initiated and maintained similar contacts with members of the New Mexico State Legislature and state agencies. The data indicate that the purpose of this activity was to generate information in support of faculty research as well as to represent

the capabilities and image of the University as a research institution.

By 1974, Dr. Heady's goal of obtaining increased research funding for the University from outside sources began to be realized. During the 1972-1975 period, when federal funds for university research became relatively static, (Figure 1, p. 11) the institution began to move more aggressively in developing its research capabilities.

Figure 2

University of New Mexico Sponsored Research,
Development, and Demonstration Proposals,
Submitted and Funded, 1958-1978¹



Key
■ Total number of RD&D proposals submitted
■ Total number of proposals funded

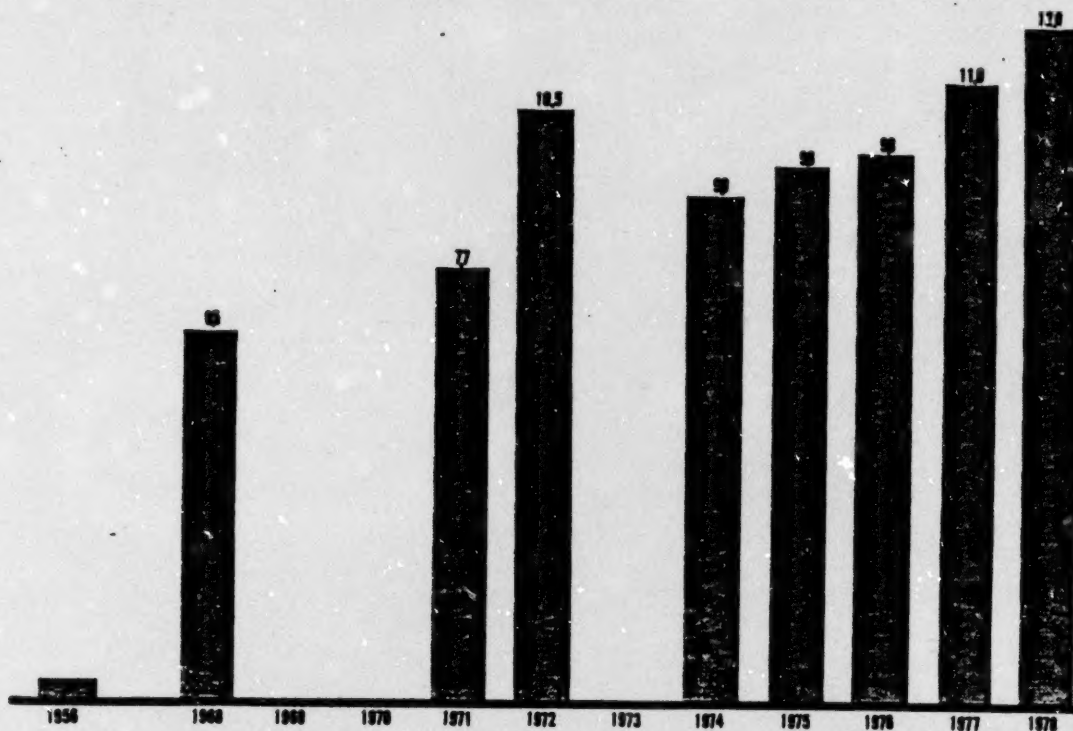
¹Statistical data for 1969 not available.

"(W)hen a lot of (universities in the nation) were retrenching, the University of New Mexico was going externally, it as in a marketing...entrepreneurial mode" (personal interview, Kasner, May 20, 1982). The data support this impression.

For example, the number of proposals submitted by faculty increased 46% between June 1971-June 1975, from 284 proposals to 613 proposals (Figure 2). The University's expenditure of research, development, and demonstration funds, during this period, increased (in constant 1972 dollars) nearly 25% from \$7.7 million to \$9.6 million (Figure 3).

Figure 3

The University of New Mexico's Expenditures¹
of Research, Development, and Demonstration Funds,² 1956-1978³



¹Expenditures refer to total amount of research support funds spent by the institution received from State, federal, foundation, and industrial sources.

²The University reported expenditures of funded projects as a total amount and identified expenditures for basic research, applied research, demonstration or training programs.

³Data were not available for the years 1969, 1970, and 1973.

In 1972, for the first time, the University was listed (54th) by the National Science Foundation in its "Total Federal Obligations to 100 Universities and Colleges Receiving the Largest Amounts, FY 1972" (Figure 4). The University remained on that listing throughout the remaining period studied.

Figure 4

The University of New Mexico's Position in
the National Science Foundation's Ranking of
the Top 100 Institutions in Total Federal Re-
search and Development Obligations for Fiscal
1972-1978¹

Year	Ranking	Year	Ranking
1972	54	1976	53
1973	77	1977	49
1974	61	1978	57
1975	63		

¹E. B. Kasner, "UNM/ORA Statistical Summary," UNM, May, 1982, Attachments 1-7.

The Vice President for Research and the Director of Research and Fellowship Services, Edmund B. Kasner, engaged in an aggressive program of gathering and distributing pertinent information on research opportunities and providing a wide variety of other types of support services for faculty. In addition, the Office of Research and Fellowship Services identified shifts in federal funding policy to assist both the Vice President for Research and research faculty in adjusting strategies and taking appropriate action to secure support.

Beginning in 1972, representatives of the University met

informally with other Rocky Mountain and high plains universities to share information concerning specific federal research support opportunities and to discuss common research interests. The institutions participating in this informal association used this rationale to increase the flow of strategic research support information. Although these institutions were competing for research support in an environment that was considered "very tight" (personal interview, Kasner, May 20, 1982) the mutual benefits derived contributed to their respective competitive positions. This ad hoc group addressed specific issues concerning federal research policy and research opportunities, discussed internal administrative mechanisms and programs to stimulate faculty research, and advocated for more congressional support for University-based research.

After the 1973 Arab oil embargo, interest in energy-resource development increased substantially in New Mexico. The University participated in an intra-state research development plan to apply the research development plan to apply the research capabilities of New Mexico universities to the national energy crisis.

The national energy crisis brought on by the 1973 Arab oil embargo and the subsequent Congressional enactment of the Energy Reorganization Act of 1974 brought the Rocky Mountain region's energy reserves and research capabilities into sharp focus when plans for "energy self-sufficiency" were developed.

The Energy Research and Development Administration (ERDA) was created and was charged "with the responsibility for developing or increasing the efficiency and reliability of all energy sources" (synopsis of the LASL Management Project, UNM, 1977, p. 3). ERDA's

mission effectively translated into a substantial energy research and development effort in which it planned to involve universities in a number of significant ways.

In 1975 the ad hoc group of university vice presidents for research became an informal association called the Intermountain University Research Administrators (IMURA). Nineteen member institutions continued to exchange information, strengthen institutional-federal relations and influence research policy at the national level. With the increase in federal energy research the IMURA group increased its mutual support activities. Among the developing areas of concern was the federal research-agenda that resulted from the 1973 Arab oil embargo. The manner and degree to which regional institutions would be involved was both important and problematic.

In June 1975, ERDA published a National Plan for Energy Development and Demonstration-ERDA 48 , which indicated that ERDA would contract for a substantial number of research programs, encourage joint research and development projects, including the management of government facilities, coordinate energy research and development efforts with the private sector and with universities, and solicit planning assistance from regional groups. Following the publication of its national plan, ERDA convened a two-day meeting in November 1975 to solicit university participation in its joint efforts. At this conference Dr. Robert Seamans, Jr., ERDA Administrator, said that "ERDA (would) deal with the universities as professional partners in the overall national energy research and development effort" (A Summary: Western Universities Propose to Manage the Los Alamos Scientific Laboratory, UNM, 1977, p. 5).

According to Dr. Silverman who attended this meeting, Dr. Seamans' statement was viewed at the University of New Mexico as an indication that universities would play an important part in ERDA's effort to pursue the goal of energy independence for the nation.

Dr. Silverman became concerned that "Sandia and Los Alamos (Scientific Laboratories) were beginning to move...into all the areas that previously they did not engage and which have been very largely the areas in which we, at the University, were competing. That was our major problem" (personal interview, Silverman, March 24, 1982). Dr. Silverman was concerned with the implications of LASL's emergence as an energy research laboratory, LASL's competition with the University for research support, its proselytizing of University faculty researchers, and the resulting reduction of the institution's capacity to compete effectively in certain research areas became important concerns. LASL's move into a competitive position with the University of New Mexico and other regional universities foreshadowed a far more reduced participation than regional university administrators initially expected.

On May 17, 1976, ERDA held a Western regional meeting in Denver, Colorado. The meeting included representatives of regional universities and energy coordinating agencies. During a meeting between several university representatives and ERDA, administrators indicated that a review of the LASL-University of California contract was in progress and that "there was still time for the universities to submit a competing proposal (to manage LASL) if they acted quickly" ("Synopsis of the LASL Management Project," UNM, 1976 p. 4). Several other developments within ERDA were discussed during

the May 17, 1976, meeting that suggested the direction ERDA would take in pursuit of its future research program. LASL, with ERDA's support, presented a proposal that it become a regional energy laboratory that would manage the administrative and fiscal aspects and provide direction for ERDA's regional energy-research program. The regional research universities objected to LASL's circumscribing their involvement in regional energy research by managing ERDA's research programs and substituting an administrative support unit that would replace the competitive peer-review process. The expectations of the regional research universities had been substantially diminished since the November and December 1975 meetings with Dr. Seamans, Jr., at ERDA offices in Washington, D.C., and now LASL's emergence as ERDA's regional energy laboratory and its control of regional energy research caused concern within the IMURA group.

The majority of institutions that were members of IMURA were in similar stages of developing their research capabilities and, although they were in competitive and entrepreneurial modes, they were mutually supportive. They came to a consensus on the importance of insuring that regional institutions participate in the government's energy research program. Dr. Silverman noted that this group "had a sense of a larger game that was being played (and) felt...that if we didn't cooperate with some reasonableness, we didn't stand a chance in the competition" (personal interview, Silverman, March 24, 1982). Thus, the focus of the IMURA group was competition on a national scale for access to resources at a regional level.

The IMURA group saw most of the federal resources for support of research being geographically divided between the West and East

Coasts. Members felt that to protect their interests in securing research support, they would have to increase the visibility of their regional research capabilities, cooperate on a more formal basis and bring collective action to bear to ensure that the federal division of research grants would include regional institutions.

By mutual agreement of IMURA, Dr. Silverman was to direct the group's LASL management proposal and undertake the formation of a consortium of Rocky Mountain and High Plains universities, and the Western Regional Scientific Laboratory, Inc.

On June 25, 1976, Dr. Silverman wrote to Dr. Seamans, ERDA Administrator, stating that

"the University of New Mexico, in association with a regional consortium of Rocky Mountain and High Plains universities, intends to submit a proposal to the Energy Research and Development Administration to undertake the contract management of the Los Alamos Scientific Laboratory" (Silverman to Seamans, June 25, 1976).

Copies of this letter were sent to ERDA and LASL officials, IMURA, the New Mexico Congressional Delegation, the Governor of New Mexico, and key administrators in the University of New Mexico.

On August 5, 1976, Dr. Seamans wrote Dr. Davis, President of the University of New Mexico, to inform him that ERDA's consideration of the extension of the contract for management of LASL had been completed. He stated that his approval of opening negotiations with the University of California

"was based on consideration of all circumstances surrounding the contract, including the...universities' interest in... the study of energy problems (and which he considered) as not appropriate to LASL's primary mission...research, development, and testing for ERDA's nuclear weapons program" (Seamans to Davis, August 5, 1982).

Dr. Seamans' decision to open negotiations with the University of

California was made approximately seven months ahead of the schedule previously discussed with top ERDA officials in June 1976.

Dr. Seamans' letter raised some rather basic questions about ERDA's intent to rely on universities to find solutions to national energy problems. These universities believed that ERDA's position not to consider their proposal to manage LASL was in direct contradiction of ERDA's policy on the desirability of substantial interaction with universities and believed that Dr. Seamans should reverse his decision to open negotiations with the University of California. In addition, the Rocky Mountain universities believed there was sufficient indications that LASL would increase its participation in energy research and emerge as a substantial competitor for federal research support.

The day after Dr. Seamans wrote his letter to President Davis, on August 6, 1976, the IMURA group met at the University of Montana at Missoula to draft a proposal for the formation of a consortium of universities in the Rocky Mountain and High Plains region. The purpose of this consortium, the Western Regional Scientific Laboratory, Inc., was to manage the Los Alamos Scientific Laboratory.

The University increased and persisted in its contacts with the New Mexico, Colorado and Wyoming Congressional Delegations to bring increasing political pressure to bear on ERDA in an effort to force a reversal of its contract award decision. At the request of Dr. Silverman, Senator Domenici made inquiries among members of the Joint Atomic Energy Committee to determine how members were informed about the LASL contract renewal; members of the New Mexico and Wyoming Congressional Delegations generated support for a Congress-

sional hearing into the procedures used to make the contract award decision; and staff briefings were planned for important members of Congress, their staff, and the new Carter Administration.

On January 11, 1977, Dr. Silverman met with members of the WRSL, Inc., proposal staff and indicated that in consideration of ERDA's failure to move on the issue of establishing a cooperative relationship between LASL and the universities, it was time to increase its pressure on ERDA. Final plans to incorporate the consortium were made, press releases prepared and Mr. Kasner was designated to brief the New Mexico Congressional Delegation in Washington.

During the middle of January 1977, Dr. Seamans wrote to President Davis informing him of ERDA's decision to proceed with negotiations with the University of California for the management of LASL and disavowed any intent to discuss future management of LASL by the WRSL, Inc. The consortium proceeded with its proposal preparation plans. At the end of January, LASL convened a meeting to review its research programs. The facts centered around LASL's national security role and deemphasized its energy research role. The 1% budget figure presented by LASL as an accurate reflection of the extent of its regional energy work clearly contradicted LASL's and ERDA's previously published statistics as well as those of the University of California. It was significantly less than the figure, over half of LASL's operational budget, which Dr. Agnew presented in 1975.

On March 24, 1977, Dr. Silverman received a letter from General Starbird (ERDA Assistant Administrator for National Security) along with the unopened proposal. General Starbird indicated that he

was acting on directions from the ERDA Administrator responding to WRSL, Inc.'s, unsolicited proposal for management of LASL. He indicated that the contract extension had already been signed for an additional five year period. He also encouraged the universities to continue discussions with ERDA officials "on the broader questions of regional research and development and the role that UNM can plan" (Starbird to Silverman, March 24, 1977).

Although the universities pursued alternative arrangements to participate in ERDA research programs and to improve relations with LASL and ERDA, no clear picture emerged from ERDA during the Spring of 1977. The universities shifted their emphasis from the long-term goal of managing LASL to pursuing a contractual relationship with ERDA to examine regional research problems and capabilities.

The continued unwillingness of ERDA to deal with the regional universities and their several proposals was frustrating and discouraging to Dr. Silverman. The data suggest that his efforts to muster political support proved ineffective in moving ERDA to reconsider its management contract decision and to consider a role for regional universities in energy research.

Although the universities' attempt to take over the management of LASL failed and the consortium was dissolved, it did apparently have a significant impact on ERDA's plans to make LASL a regional energy laboratory. As a result of this intense controversy, ERDA confirmed that LASL would remain primarily a weapons laboratory. This policy decision effectively prevented LASL from becoming a substantial competitor to regional universities for energy research support. ERDA also dropped its plans to designate LASL as a regional project-

reviewer that could control the flow of energy research in the region. Thus, LASL's threat as a direct competitor to regional universities diminished substantially and the acquisition of energy research support continued as it had in the past, through the traditional ERDA peer-review process.

The reorganization of the institution's structure, its faculty research support mechanism, its association with the Intermountain University Research Administrators, and its aggressive, entrepreneurial research acquisition efforts contributed to the institution reducing the uncertainty of its research environment, provided a "mechanism" for more effectively promoting and supporting research, and provided a mechanism through which the institution could actively protect its research interests. The data indicate that between 1968 and 1978 the number of research proposals submitted by the University increased 382% from 270 to 1,032, expenditures of RD&D funds increased 185% from \$6.5 to \$12.0 million dollars, and remained on the National Science Foundation's list of "Total Federal Obligations to 100 Universities and Colleges Receiving the Largest Amounts..." between 1972 and 1978. These proxy measures were used to evaluate the University's success at securing external research support and to assess its position with respect to other national graduate institutions.

Analysis

A review of the pertinent general literature on the acquisition of external resources necessary for organizational maintenance and growth indicates that it plays a prominent role in the analysis of organizational-environmental interaction processes (Higbie, 1981;

Katz and Kahn, 1978; Martorana and Kuhns, 1975). External resources consist of essential commodities not directly controlled by the organization; such commodities must be secured from the organization's external environment (Aldrich and Pfeffer, 1976; Pfeffer and Salancik, 1978; Yutchman and Seashore, 1967). Securing resources is dependent upon important tactical decisions made by administrators and based upon their assessment of the political and economic conditions of the environment. Some tactical decisions are directed towards the acquisition of sufficient economic resources to insure the continued survival of the organization (Buckley, 1967; Emery and Trist, 1965; Katz and Kahn, 1978; Perrow, 1970). When uncertainty or decline in the external resource environment is perceived, it triggers administrative corrective action (Ansoff, 1970; Cyert and March, 1963). Bacharach and Lawler (1980) note that the greater the scarcity of resources in the environment, the greater the likelihood of the formation of interest-group coalitions. These political-economic coalitions focus their attention on the protection or enhancement of their resource positions at the expense of those outside the coalition. Meyer (1978) notes that the formation of coalitions may be stimulated by an "exogenous shock" that may take the form of "competitive exclusion" (Gause, 1934) in the pursuit of external resources.

In the specific case of the University of New Mexico, the University reorganized its internal organizational structure to facilitate the acquisition of resources. Key administrators made the strategic decision to pursue the establishment of the Office of the Vice President for Research, define its function, and

provide direction in its pursuit of external research support. The Office maintained an extensive network of contacts in its task environment, through which it assessed both the political and economic conditions surrounding it.

The events of 1974 and 1975, which included ERDA's utilization of its national laboratory system to conduct its energy research program, the emergence of LASL as a competitor, and its emergence as a regional energy laboratory created a sense of increased competition for federal energy research funding. Corrective action was taken by Dr. Silverman and Mr. Kasner in their efforts to develop state, regional, and national research support for the University. The impact of LASL's announcement (1976) of its plans to become a regional energy laboratory provided an exogenous shock to the institution. This event stimulated some members of IMURA to form a coalition. IMURA viewed LASL's emerging role in the region as a significant threat to its ability to compete for energy research support. Upon ERDA's invitation, IMURA members prepared a proposal and formed a consortium, WRSL, Inc., to take over the management of LASL. The purpose of this consortium was to protect the research resource position of the regional universities and to influence the direction of energy research in the region. Dr. Silverman perceived the move by ERDA-LASL in zero sum terms and formed a coalition with the administrators of other regional institutions to take radical corrective action to protect their resource interests by directly managing LASL.

In sum, key University administrators made the strategic decision to restructure the institution to encourage the development

of faculty research and to pursue research support. The incumbents of the Office of the Vice President for Research defined the role of the Office and directed its efforts to pursue research support in an increasingly more competitive environment. This chain of events suggests the following propositions.

1.0 The greater the dependency of a university on its external environment for the support of faculty research, the more active will be key administrators in resource acquisition.

1.1 The greater the threat to a university's ability to secure research support, the more likely the institution will participate in interinstitutional coalitions.

Toward a Theory of External Resource Acquisition in Developing Research Universities

Zetterberg (1965) notes that to ask for an explanation of a phenomenon is to ask for a theory. The propositions suggested by the data that are related to the phenomenon of the emergence of the University of New Mexico as a graduate research institution is a review of what has been learned about external resource acquisition from this unique study of a single institution. External resource acquisition is a "determinent" (Zetterberg, 1965) and its corresponding properties emerged from the data. A limited but "grounded" theoretical explanation (Glaser and Strauss, 1967) of the phenomenon of the development of the University in the direction of a graduate research university is presented as a statement that concludes the analysis and can be summarized thus:

The development of an undergraduate teaching institution in the direction of a graduate research university is partially explained as a function of the degree of effort towards and success at external resource acquisition.

Significance of the Study

Organizations are social inventions that are both fluid and dynamic. They move in time and space, act and react, and are shaped by a combination of external and internal environmental factors that both threaten survival and provide impetus for modification. The manner in which environmental influences affect organizations and the adaptive mechanisms utilized by University leaders are important foci for organizational research.

This ethnohistorical study of the University of New Mexico is unique in both setting and purpose. It represents the first ethnohistorical effort to contextually examine external resource acquisition as a factor associated with the development of a graduate research university at a time when federal funding for research support remained at a relatively static level. This study provides a contextually rich historical description of a variety of forces that influenced some members of the faculty and administration of the University of New Mexico to take a particular course of action that shaped the future character of the institution.

It is hoped that any conclusions drawn from this research effort will contribute to the ability of universities to understand the forces that are associated with the emergence of research institutions. At the very least, it is hoped that this study will contribute to the literature on how universities adapt to changes in their external research support environment and the utilization of external resource acquisition as a mechanism associated with the development of research universities.

The value of qualitative research rests in the discovery of new understandings and insights into the development of grounded theory. Although this paper does not assert that the grounded theory developed here will reflect the manner in which all institutions adapt to external changes and develop in the direction of graduate research institutions; however, it does advance the premise that understanding the response of one institution may contribute to both fundamental and general understandings of how similar universities respond to similar changes and needs in their environments. Although the propositions developed here are contextually limited to this study, they have raised questions for further research into this phenomenon.

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